

WHAT IS CLAIMED IS:

1. An apparatus for handling communication signals comprising the combination of:

5           optical interface means for receiving optical signals, converting said optical signals into electrical signals and demultiplexing said electrical signals from an optical channel format to a synchronous transport signal, STS, format;

          STS multiplexing means for receiving the demultiplexed STS signals and generating an output of parallel STS signals arranged in at least one virtual tributary group, VTG;

10           VTG circuit means for mapping and demapping a virtual tributary group; and

          channel unit means for receiving and processing said virtual tributary group and for delivering said virtual tributary group to predetermined customer instruments.

15           2. An apparatus according to claim 1, wherein said STS multiplexing means comprises means for sending loop-back signals for diagnosing faults in said optical interface means and said VTG circuit means.

20           3. An apparatus according to claim 1, wherein said VTG circuit means comprises:

          line interface circuit means comprising an input and an output for receiving and transmitting DS1 data streams, respectively, said line interface circuit means being operable to perform line decoding and clock recovery on received DS1 data streams; and

25           VT mapper means coupled to said line interface circuit means for mapping data from the received DS1 data streams to a virtual tributary in one direction of signal flow, and for demapping asynchronous or byte-synchronous virtual tributaries to DS1 data streams for transmission by said line interface circuit means in the  
30           opposite direction of signal flow.

4. An apparatus according to claim 1, further comprising a local area network, a local area network interface for each of a plurality of devices comprising said optical interface means, said STS multiplexing means, and said VTG circuit, and signal processor means having a local area network interface for communicating with each of said plurality of devices.

5. A VTG circuit for processing DS1 data streams and virtual tributary groups, and for interfacing with circuit means leading to channel units, the VTG circuit comprising the combination of:

line interface circuit means comprising an input and an output for receiving and transmitting DS1 data streams, respectively, said line interface circuit means being operable to perform line decoding and clock recovery on received DS1 data streams; and

virtual tributary mapper means coupled to said line interface circuit means for mapping data from the received DS1 data streams to virtual tributaries in one direction of signal flow, and to said circuit means leading to channel units for demapping asynchronous or byte-synchronous virtual tributaries therefrom to DS1 data streams for transmission by said line interface circuit means in the opposite direction of signal flow.

6. A method of handling communication channels for load equalization in a system having multiple connections to channels in an actual remote digital terminal comprising the steps of:

defining a number of virtual remote digital terminals by selecting a plurality of groups of said channels to represent respective said virtual remote digital terminals, wherein said plurality of groups of channels need not be characterized by the same number of said channels;

administering each group in said plurality of groups of channels as though the channels of said group constituted a single actual remote digital terminal; and

determining a concentration ratio for each group in said plurality of groups of channels independently of each other group using software without changing any hardware configurations of said actual remote digital terminal.